

fourth lens is 1.60 or more. The fourth lens may have a small Abbe number. For example, an Abbe number of the fourth lens is 30 or less.

[0068] The fifth lens has a refractive power. For example, the fifth lens has a negative refractive power.

[0069] The fifth lens has a meniscus shape. For example, both object-side and image-side surfaces of the fifth lens are concave.

[0070] The fifth lens has an aspherical surface. For example, both surfaces of the fifth lens are aspherical. The fifth lens is formed of a material having high light transmissivity and excellent workability. For example, the fifth lens may be formed of plastic. However, a material of the fifth lens is not limited to plastic. For example, the fifth lens may be formed of glass.

[0071] A person of ordinary skill in the relevant art will appreciate that each of the first through fifth lenses may be configured in an opposite refractive power from the configuration described above. For example, in an alternative configuration, the first lens has a negative refractive power, the second lens has a positive refractive power, the third lens has a negative refractive power, the fourth lens has a negative refractive power, and the fifth lens has a positive refractive power. Other variations of the refractive power for the above-described embodiment may be implemented.

[0072] The filter filters a partial wavelength from incident light incident through the first to fifth lenses. For example, the filter filters an infrared wavelength of the incident light.

[0073] The image sensor may realize high resolution images of 1300 mega pixels. For example, a unit size of pixels configuring the image sensor may be 1.12  $\mu\text{m}$  or less.

[0074] The stop is disposed in order to adjust an amount of light incident to the lenses. For example, the stop is adjacently disposed to the object-side surface of the first lens. However, a person skilled in the art that the stop may be placed at other positions, such as between the lenses, and more than one stop may be implemented.

[0075] The optical imaging system satisfies the following Conditional Expressions 1 through 4:

[0076] [Conditional Expression 1]  $0.7 < \text{TTL}/f < 1.1$

[0077] [Conditional Expression 2]  $1.1 < \text{TTL}/\text{ImgH}$

[0078] [Conditional Expression 3]  $20 < \text{FOV} < 35$

[0079] [Conditional Expression 4]  $0.16 < R1/f < 2.0$ .

[0080] In one example, TTL is a distance from the object-side surface of the first lens to the imaging plane,  $f$  is an overall focal length of the optical imaging system, ImgH is a distance from a center of the imaging plane to a corner, FOV is a half of a field of view of the optical imaging system, and R1 is a radius of curvature of the object-side surface of the first lens.

[0081] The optical imaging system satisfying the above Conditional Expressions 1 through 4 is easily miniaturized and may be mounted in a small terminal.

[0082] Also, in one embodiment, each of the first to fifth lenses may be separate lenses configured as described above. A distance between lenses may vary. In another embodiment, at least one of the first to fifth lenses may be operatively connected or in contact with another one of the first to fifth lenses.

[0083] An optical imaging system, according to a first embodiment, will be described with reference to FIG. 1.

[0084] The optical imaging system 100, according to the first embodiment, includes an optical system including a first lens 110, a second lens 120, a third lens 130, a fourth lens

140, and a fifth lens 150. In addition, the optical imaging system 100 includes a filter 160, an image sensor 170, and a stop ST.

[0085] In an embodiment, the first lens 110 has a positive refractive power, and an object-side surface thereof is convex and an image-side surface thereof is concave. For example, the object-side surface of the first lens 110 is convex in a paraxial region, and the image-side surface of the first lens 110 is concave in the paraxial region. The second lens 120 has a negative refractive power, and both surfaces thereof are concave. For example, the object-side surface of the second lens 120 is concave in a paraxial region, and the image-side surface of the second lens 120 is concave in the paraxial region. The third lens 130 has a positive refractive power, and an object-side surface thereof is concave and an image-side surface thereof is convex. For example, the object-side surface of the third lens 130 is concave in a paraxial region, and the image-side surface of the third lens 130 is convex in the paraxial region. The fourth lens 140 has a positive refractive power, and an object-side surface thereof is concave and an image-side surface thereof is convex. For example, the object-side surface of the fourth lens 140 is concave in a paraxial region, and the image-side surface of the fourth lens 140 is convex in the paraxial region. The fifth lens 150 has a negative refractive power, and both surfaces thereof are concave. For example, the object-side surface of the fifth lens 150 is concave in a paraxial region, and the image-side surface of the fifth lens 150 is concave in the paraxial region. The stop ST is adjacently disposed to the object-side surface of the first lens.

[0086] The optical imaging system configured as described above may represent aberration characteristics as illustrated in FIG. 2. FIG. 3 is a table representing characteristics of lenses of the optical imaging system according to the first embodiment.

[0087] An optical imaging system, according to a second embodiment, will be described with reference to FIG. 4.

[0088] The optical imaging system 200, according to the second embodiment, includes an optical system including a first lens 210, a second lens 220, a third lens 230, a fourth lens 240, and a fifth lens 250. In addition, the optical imaging system 200 includes a filter 260, an image sensor 270, and a stop ST.

[0089] In an embodiment, the first lens 210 has a positive refractive power, and an object-side surface thereof is convex and an image-side surface thereof is concave. For example, the object-side surface of the first lens 210 is convex in a paraxial region, and the image-side surface of the first lens 210 is concave in the paraxial region. The second lens 220 has a negative refractive power, and an object-side surface thereof is convex and an image-side surface thereof is concave. For example, the object-side surface of the second lens 220 is convex in a paraxial region, and the image-side surface of the second lens 220 is concave in the paraxial region. The third lens 230 has a positive refractive power, and an object-side surface thereof is concave and an image-side surface thereof is convex. For example, the object-side surface of the third lens 230 is concave in a paraxial region, and the image-side surface of the third lens 230 is convex in the paraxial region. The fourth lens 240 has a positive refractive power, and an object-side surface thereof is concave and an image-side surface thereof is convex. For example, the object-side surface of the fourth